

I Claim

1. A medical diagnostic device for measuring an analyte concentration or property of a biological fluid, comprising

a) a sample inlet for introducing a sample of the biological fluid into the device;

b) a first capillary channel for conveying the sample from the inlet to a branching point;

c) a capillary connecting channel for conveying a first part of the sample from the branching point through a measurement area, in which is measured a physical parameter of the sample that is related to the analyte concentration or property of the fluid, and to a first stop junction;

d) a capillary bypass channel for conveying a second part of the sample in a first direction from a first region, proximate to the branching point, to an overflow region, distal to the branching point, the first region having a capillary dimension in a second direction substantially perpendicular to the first direction;

e) a second stop junction in the bypass channel, comprising a boundary region that

i) separates the first and overflow regions,

ii) has a second predetermined dimension in the second direction that is greater than the capillary dimension, and

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iii) forms an angle that points toward the first region, whereby any excess sample that enters the sample inlet will pass through the second stop junction into the overflow region.

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2. The device of claim 1, further comprising a suction device, in fluid communication with the first and second stop junction, for drawing sample from the sample inlet toward stop junctions.

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3. The device of claim 2, in which the device comprises a first layer and second layer, at least one of which has a resilient region over at least a part of its area, separated by an intermediate layer, and in which

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a) cutouts in the layers form, with the layers, the sample inlet, first channel, connecting channel, measurement area, and bypass channel;

b) the suction device comprises a bladder that

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i) is distal from the sample inlet,
ii) comprises at least a part of the resilient region, and

iii) has a volume that is at least about equal to the combined volume of the first channel, measurement area, connecting channel, and bypass channel, and

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c) the first and second stop junctions comprise coinciding holes in the first, second, and intermediate layers that are sandwiched by a third layer and fourth layer.

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10. The device of claim 9 in which the measurement area in the first alternate path comprises thromboplastin, bovine eluate, and recombinant Factor VIIa and the measurement area in the second alternate path comprises thromboplastin and bovine eluate.

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